Proceedings of the Zoological Institute RAS
Vol. 316, No. 1, 2012, pp. 50–56

УДК 568.135:551.763.3

NEW DATA ON THE SOFT-SHELLED TURTLES FROM THE UPPER CRETACEOUS KYRKKUDUK I LOCALITY OF SOUTHERN KAZAKHSTAN

N.S. Vitek[1] and I.G. Danilov[2]*

[1]*Department of Geological Sciences, The University of Texas at Austin, EPS RM 1.130, 1 University Station C9000, Austin, TX 78712-0254 USA; email: nsvitek@utexas.edu*

[2]*Zoological Institute of the Russian Academy of Sciences, Universitetskaya Emb. 1, 199034 Saint Petersburg, Russia; e-mail: igordanilov72@gmail.com*

ABSTRACT

We re-examine one previously described trionychid specimen (a posterior part of a carapace formerly attributed to *Trionyx zakhidovi* Khosatzky, 1966) and describe additional trionychid shell material from the Upper Cretaceous (Santonian – ?Middle Campanian) Kyrkkuduk I locality (= Sary-Agach) in southern Kazakhstan. All material was collected by the Russian geologist and paleobotanist V.D. Prinada in the 1920s. Based on new observations and material, we refer much of the material from Kyrkkuduk I to "*Trionyx*" *kansaiensis* Vitek et Danilov, 2010, a shell taxon known from the Late Cretaceous of Tadzhikistan and Kazakhstan. The remaining material is assigned to a second trionychid taxon that is similar to some members of the tribe Trionychini from the Late Cretaceous of Asia, but is identified conservatively as Trionychidae indet. Thus, we confirm the presence of at least two forms of trionychids in the Kyrkkuduk I locality, as was previously proposed by earlier authors, although our taxonomic identifications differ. The newly referred material of "*Trionyx*" *kansaiensis* expands the geographic range of this species and provides new information about its morphology, especially the structure of the xiphiplastron and variation of the neurals.

Key words: Asia, Kazakhstan, Trionychidae, turtles, Upper Cretaceous

НОВЫЕ ДАННЫЕ О ТРЕХКОГОТНЫХ ЧЕРЕПАХАХ ИЗ ВЕРХНЕМЕЛОВОГО МЕСТОНАХОЖДЕНИЯ КЫРККУДУК I ЮЖНОГО КАЗАХСТАНА

Н.С. Витек[1] и И.Г. Данилов[2]*

[1]*Department of Geological Sciences, The University of Texas at Austin, EPS RM 1.130, 1 University Station C9000, Austin, TX 78712-0254 USA; email: nsvitek@utexas.edu*

[2]*Зоологический институт Российской академии наук, Университетская наб. 1, 199034 Санкт-Петербург, Россия; e-mail: igordanilov72@gmail.com*

РЕЗЮМЕ

Мы переизучили один ранее описанный экземпляр (задняя часть карапакса, прежде относимая к *Trionyx zakhidovi* Khosatzky, 1966) и описываем дополнительный панцирные материал по трионихидам из верхнего мела (сантона – ?средного кампана) местонахождения Кырккудук I (= Сары-Агач) в Южном Казахстане. Весь материал был собран русским геологом и палеоботаником В.Д. Принадой в 1920-е годы. На основе новых наблюдений и материалов мы относим большую часть материала из Кырккудука I к "*Trionyx*" *kansaiensis* Vitek et Danilov, 2010, «панцирному» таксону, известному из позднего мела Таджикистана и Казахстана. Остальной материал относится ко второму таксону трионихид, который похож на некоторых членов трибы Trionychini из позднего мела Азии, но консервативно определяется как Trionychidae indet. Таким образом, мы подтверждаем присутствие, по крайней мере, двух форм трионихид в местонахождении Кырккудук I, предполагавшееся предшествующими исследователями, хотя наши таксономические определения отличаются. Новый материал по "*Trionyx*" *kansaiensis* расширяет географическое распространение этого вида и дает новую информацию о его морфологии, особенно о строении ксифипластронов и изменчивости невральных пластинок.

Ключевые слова: Азия, Казахстан, Trionychidae, черепахи, верхний мел

*Corresponding author / Автор-корреспондент

INTRODUCTION

The Trionychidae Gray 1825, or soft-shelled turtles, are a group of highly aquatic cryptodires (Meylan 1987). They first appeared in Asia in the Early Cretaceous (Aptian–Albian), then in North America in the Late Cretaceous (Cenomanian), and spread to most other continents in the Cenozoic (see review by Danilov 2005). The phylogeny and taxonomy of the group are still not entirely understood (Meylan 1987; Engstrom et al. 2004; Joyce and Lyson 2010). This is especially true for Cretaceous trionychids, which are important for understanding the early diversification and evolution of the family. Recently, Danilov and Vitek (2009; in press) published a review of all described and/or figured trionychid specimens from the Cretaceous of Asia. Those reviews demonstrated that only a few Asian Cretaceous taxa of trionychids are based on properly described and figured material, and even fewer of those recognized taxa are named species.

In this paper we redescribe one historical specimen (a posterior part of a carapace formerly attributed to *Trionyx zakhidovi* Khosatzky, 1966) and report on previously undescribed specimens from the Upper Cretaceous Kyrkkuduk I locality (= Sary-Agach; see Nessov 1997) in southern Kazakhstan (complete locality and age data are provided below) collected by the Russian geologist and paleobotanist V.D. Prinada in the 1920s. Based on new observations and material, we attribute some of the material to "*Trionyx*" *kansaiensis* Vitek et Danilov, 2010, and identify a second trionychid taxon (Trionychidae indet.) from this locality.

History of study of trionychids from Kyrkkuduk I locality

Two forms of trionychids from the Kyrkkuduk I locality (Fig. 1) were reported by Prinada (1927). *Plastomenus*? *jaxarticus* nov. sp. (nomen nudum), *Aspideretes jaxarticus* nov. sp. (nomen nudum) and *Aspideretes* sp. (several forms) were mentioned but left undescribed by Riabinin (1938), who studied the collections made by Prinada. Khosatzky (1966), who studied the same collection, noted that it was difficult to establish what specimens correspond to what species names. In his paper, Khosatzky established *Trionyx zakhidovi* Khosatzky, 1966 based on a giant femoral bone (holotype) and a posterior part of a carapace from the Prinada's collection. He also mentioned that the same collection contained several fragments of costals of large trionychids, which probably belong to *T. zakhidovi*.

Two new species, *Paleotrionyx riabinini* Kuznetsov et Chkhikvadze, 1987 and *Trionyx riabinini* Kuznetsov et Chkhikvadze, 1987, were described by Kuznetsov and Chkhikvadze (1987) from the Upper Cretaceous of Shakh-Shakh locality in Kazakhstan (Fig. 1). These authors noted that the generic attribution of *T. zakhidovi* is unclear, because the current state of knowledge does not allow distinguishing trionychid species by femoral bones. They also supposed that the posterior part of a carapace described by Khosatzky (1966), probably, belongs to *T. riabinini*. This opinion was shared by Kordikova (1991).

Later, two taxa of trionychids from Kyrkkuduk I locality (as Sary-Agach; lower part of Darbazin Svita) were listed as "probably, cf. *Paraplastomenus riabinini* (Kuznetsov et Chkhikvadze, 1987), cf. *Axestemys* sp." (Kordikova 1994). Thus, she proposed the correspondence of *Plastomenus*? *jaxarticus* and *Aspideretes jaxarticus* to *Trionyx* (as *Paraplastomenus*) *riabinini* and *Paleotrionyx* (as *Axestemys*) *riabinini*.

Nessov (1997, p. 107) also mentioned only two trionychid taxa from Kykkuduk I locality: "*Trionyx*" *zakhidovi* Khosatzky, 1966 and cf. *Paraplastomenus* sp. The name cf. *Paraplastomenus* sp. was used for the posterior part of a carapace described by Khosatzky (1966). Nessov (1997) also noted that trionychid remains, probably, come from the Syuk-Syuk Formation rather than from Darbaza Formation (= Darbazin Svita) as indicated by Kordikova (1994).

Chkhikvadze (2007) placed *Trionyx zakhidovi* in Trionychidae incertae sedis, although supposed its synonymy with *Paleotrionyx* (as *Eurycephalochelys*) *riabinini* based on large size.

Vitek and Danilov (2010) described new trionychid material from the Upper Cretaceous of Tadzhikistan and Kazakhstan (Kansai and Shakh-Shakh localities respectively; Fig. 1), which allow attribution of *Trionyx riabinini* to the genus *Aspideretoides* Gardner et al., 1995 and description of the new species "*Trionyx*" *kansaiensis* Vitek et Danilov, 2010; taxonomic assignment of *Paleotrionyx riabinini* was considered unclear. These authors (Danilov and Vitek 2009; Vitek and Danilov 2010) agreed with some previous researchers that the limb bones of trionychids are non-diagnostic below the family level and suggested that *Trionyx zakhidovi* be considered a

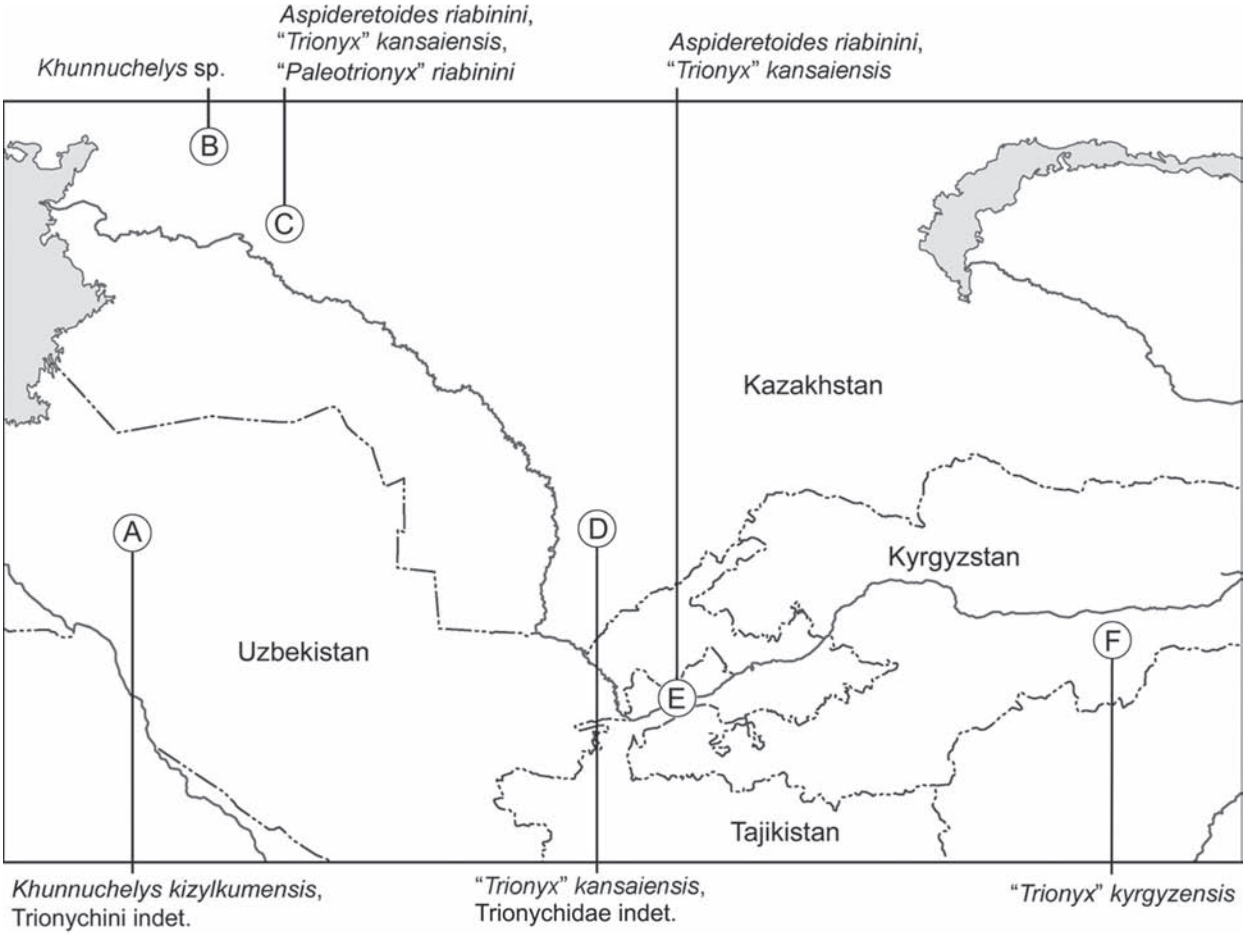


Fig. 1. Map showing main localities of Late Cretaceous trionychids in Middle Asia and Kazakhstan. A – Dzharakuduk; B – Baybishe; C – Shakh-Shakh; D – Kyrkkuduk I; E – Kansai; F – Kylodzhun (modified from Vitek and Danilov 2010, fig. 2; see that publication for data on localities other than Kyrkkuduk I).

nomen dubium within Trionychidae. In addition, the posterior part of a carapace described by Khosatzky (1966) was referred to as Trionychinae indet. 1 or Trionychinae gen et sp. indet. and considered similar to "*Trionyx*" *kansaiensis* (Danilov and Vitek 2009; in press; Vitek and Danilov 2010).

To summarize, although opinions about composition and attribution of trionychids from Kyrkkuduk I locality were expressed in many publications, the relevant material was described only in one of them (Khosatzky 1966) and has never been re-examined. In our paper we re-examine one previously described specimen and describe additional shell material from this locality.

Institutional abbreviations. CCMGE, Chernyshev's Central Museum of Geological Exploration, Saint Petersburg, Russia. ZIN PH, Paleoherpetological collection, Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.

SYSTEMATICS

Trionychidae Gray, 1825

Trionychinae Gray, 1825

***Trionyx* Geoffroy, 1809 sensu lato**

"*Trionyx*" *kansaiensis* Vitek et Danilov, 2010
(Fig. 2A–G)

Synonymy for Kyrkkuduk I material

Trionyx zakhidovi: Khosatzky 1966, p. 151, fig. 1 (part.).

Paraplastomenus riabinini: Kordikova 1991, p. 4.

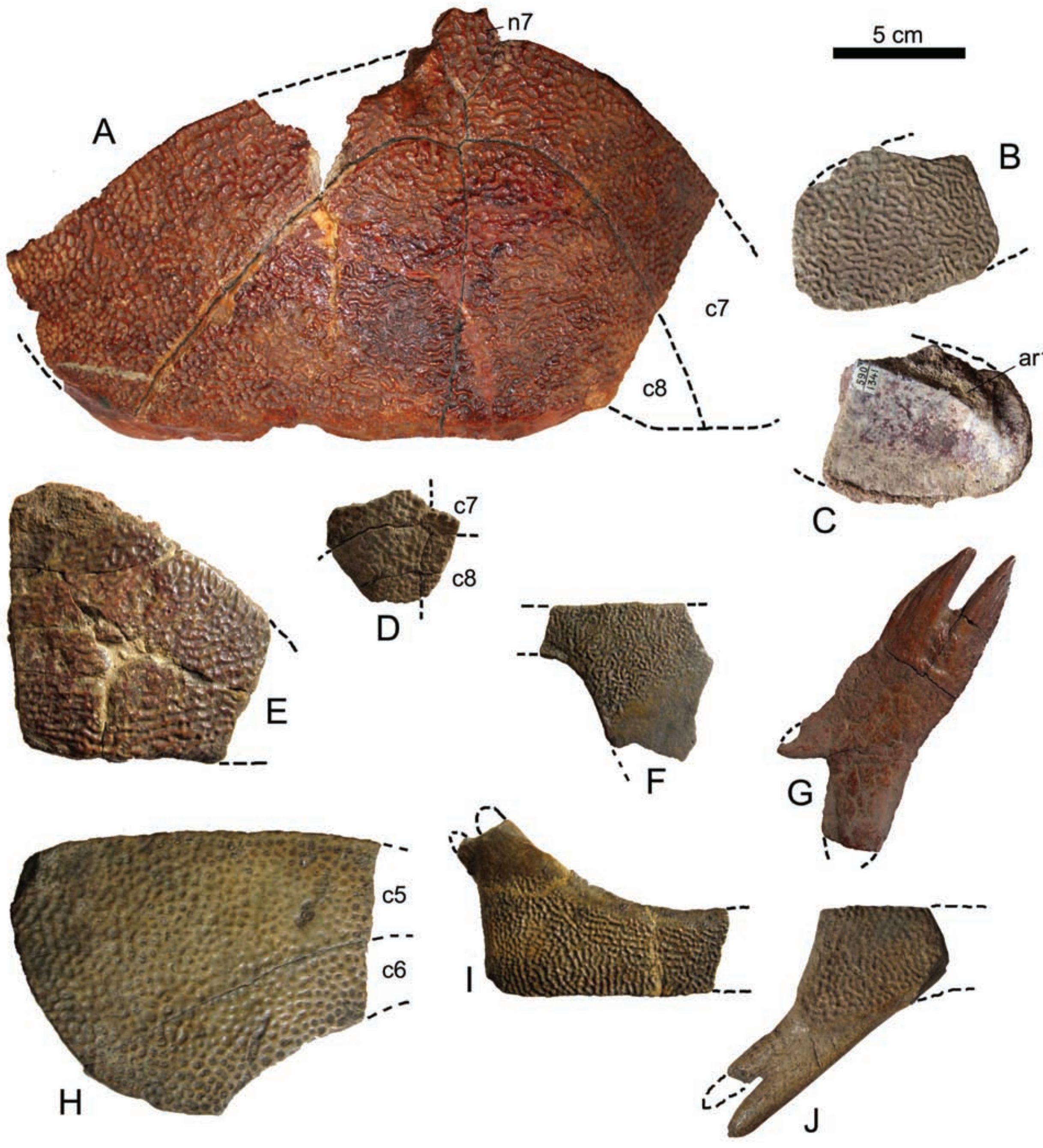


Fig. 2. Trionychid specimens from the Kyrkkuduk I locality (photos): A–G – "*Trionyx*" *kansaiensis*: A –posterior part of carapace, CCMGE 522/1341, in dorsal view; B, C –partial costal 1, CCMGE 590/1341, in dorsal (B) and ventral (C) views; D –partial costals 7 and 8, CCMGE 589/1341, in dorsal view; E –costal 8, CCMGE 598/1341, in dorsal view; F – partial hypoplastron, CCMGE 441/1341, in ventral view; G – xiphiplastron, CCMGE 1341, in ventral view; H–J – Trionychidae indet.: H – partial costals 5 and 6, CCMGE 432/1341, in dorsal view; I –partial hyoplastron, CCMGE 343/1341, in ventral view; J – partial lateral hypoplastron, CCMGE 428/1341, in ventral view. Solid lines indicate sutures and dashed lines indicate inferred margins of bones. All specimens at same magnification.

Abbreviations: ar1 – attachment site of rib 1; c1, 6–8 – costals 1, 6–8; n7 – neural 7.

Cf. *Paraplastomenus* sp.: Nessov 1997, p. 107.

Trionychinae indet. 1: Danilov and Vitek 2009, p. 54.

Trionychinae gen. et sp. indet.: Vitek and Danilov 2010, p. 392.

Referred material. CCMGE 441/1341, partial hypoplastron; CCMGE 522/1341, posterior part of a carapace; CCMGE 589/1341, partial costals 7 and 8; CCMGE 590/1341, partial costal 1 (originally labeled as "Costal of a turtle of the *Aspideretes ellipticus* (?) like form"); CCMGE 598/1341, costal 8; CCMGE 1341 (the only number indicated on the specimen), xiphiplastron (originally labeled as "Chelonia, g. et sp. ind. Part of the plastron (xiphiplastron)"). All specimens come from the Kyrkkuduk I locality (= Sary-Agach; Riabinin 1938; = area of Kyrkkuduk Well; Danilov and Vitek 2009, in press), area about 2 km in length along the northern slope of Alymtau Ridge, 6–7 km south from the well and also 3–5 km south-west from the well, Circum-Tashkent Chul, South Kazakhstan Province, Syuk-Syuk Formation and, probably, the lower part of the Darbaza Formation, Santonian – ?middle Campanian (Nessov 1997).

Description. Sculpturing is identical to that of "*Trionyx*" *kansaiensis* from Kansai and Shakh-Shakh (Vitek and Danilov 2010, figs. 6, 7). Based on the posterior part of a carapace (CCMGE 522/1341; Fig. 2A), carapace length was as long as 70 cm. The outline of the posterior border of the carapace as visible in CCMGE 522/1341 is truncated, similar to "*T.*" *kansaiensis* (Vitek and Danilov 2010, fig. 3C). The medial margin of costal 1 (CCMGE 590/1341; Fig. 2B, C) does not indicate a preneural. In both CCMGE 522/1341 and CCMGE 589/1341 (a fragment of costals 7 and 8; Fig. 2D), both costals 7 and 8 meet at the midline, with costals 8 meeting fully. This arrangement indicates that there were only seven neurals. The anteromedial margin of a costal 8 (CCMGE 598/1341; Fig. 2E) is ambiguous as to whether there was a neural 8. Otherwise, it is similar to other material of "*T.*" *kansaiensis* in its large size and triangular shape (Vitek and Danilov 2010, fig. 6N).

A medial hypoplastron fragment (CCMGE 441/1341; Fig. 2F) has sculpturing identical to the carapace. Towards the medial margin the sculpturing fades away, leaving a wide, unsculptured medial border on the hypoplastron. This pattern is also similar to "*Trionyx*" *kansaiensis* (Vitek and Danilov 2010, fig. 6R, S).

A large, nearly complete xiphiplastron (CCMGE 1341, Fig. 2G) is referred to this species. It is narrow, has a relatively straight lateral margin, a very short medial process, and is covered by an unsculptured callosity. In these characters it is identical to a partial xiphiplastron from Kansai (Vitek and Danilov 2010, fig. 6U, V). This specimen was not referred to any species, but both it and the xiphiplastron from Kyrkkuduk I differ from the sculptured xiphiplastra of *Aspideretoides riabinini* that have rounded lateral margins (Vitek and Danilov 2010, fig. 4W, X).

Trionychidae indet.
(Fig. 2H–J)

Referred material. CCMGE 343/1341, partial lateral hyoplastron; CCMGE 425/1341 and 428/1341, partial lateral hypoplastra; CCMGE 432/1341, partial costals 5 and 6 (originally labeled as "Costals of Trionychidae of the *Aspideretes foveatus* like form"). All specimens come from the Kyrkkuduk I locality (see above).

Description. Sculpturing is identical to that of *Aspideretoides riabinini* from Kansai and Shakh-Shakh, which is in pattern of thin connected ridges forming a honeycomb or netlike pattern (Vitek and Danilov 2010). Estimation of carapace length based on a partial costals 5 and 6 (CCMGE 432/1341; Fig. 2H) is approximately 40 cm. long, smaller than *A. riabinini*. The width and lateral outline of costals 5 and 6 indicate that both costals 7 and 8 made up the midline. It is probable that costals 8 were reduced.

A partial lateral hyoplastron (CCMGE 343/1341; Fig. 2I) shows the same type of sculpturing as the carapace. In addition, the lateral hyoplastral lobe is not significantly lengthened relative to the bridge, as it is in "*Trionyx*" *kansaiensis* (Vitek and Danilov 2010, fig. 3D).

A partial lateral hypoplastron (CCMGE 428/1341; Fig. 2J) is similar in shape to those of *Aspideretoides riabinini* (Vitek and Danilov 2010, fig. 4V) in having sculptured callosity which narrows distally, rather than being rounded as in "*Trionyx*" *kansaiensis*. CCMGE 425/1341 (not figured) is identical to CCMGE 428/1341 in morphology.

DISCUSSION

As was mentioned above the material from the Kyrkkuduk I assigned to "*Trionyx*" *kansaiensis* is similar to the originally described material of "*T.*"

kansaiensis, a shell taxon previously known from the Late Cretaceous of Tadzhikistan and Kazakhstan (Vitek and Danilov 2010). Both groups of specimens share a similar pattern of sculpturing, outline of the posterior border of the carapace, and morphology of costals 8 and xiphiplastra (see Description). The only difference between them is the number of neurals: eight in the original material of "*T.*" *kansaiensis* and seven in the specimens from Kyrkkuduk I. Although neither collection of specimens contains enough complete material to demonstrate variation in neural count within a single locality, the character is known to be variable in extant trionychids (Meylan 1987). In fact, a close examination of neural count shows that a species is more likely to be variable in this character than invariable (Meylan 1987; Gardner and Russell 1994). Therefore, the differing number of neurals is more likely indicative of variation than of multiple species. The material from Kyrkkuduk I presents the first xiphiplastron that we can confidently assign to the species. The lack of sculpturing and smooth external surface on the xiphiplastral callosity is notably similar to the smooth xiphiplastra of *Oliveremys uintaensis* (Leidy, 1872) and *Axestemys byssina* Cope, 1872, both extinct trionychid species from North America (Vitek 2011, in press). The Kyrkkuduk I locality lies between Kansai and Shakh-Shakh (Fig. 1), the two localities from which the original material of *"T." kansaiensis* was described. Thus, this new material not only improves our understanding of the morphology of this species, but helps fill in its geographic range.

Vitek and Danilov (2008) suggested that "*Trionyx*" *kansaiensis* may belong to the skull-based genus *Khunnuchelys* Brinkman et al., 1993, based on two lines of evidence, namely that both taxa co-occur in the Bostobe Formation and are known from similarly large specimens. However in more recent publications we refrained from formally synonymizing the two taxa pending new discoveries and descriptions of relevant Cretaceous trionychids from Asia (Danilov and Vitek 2009; Vitek and Danilov 2010).

The second form of trionychid from Kyrkkuduk I shows similarities with *Aspideretoides riabinini* in sculpturing (see Description) and shape of posterior costals with probable midline contact of costals 7 and 8 and reduced size of costals 8. However, all these characters are also typical for some members of the tribe Trionychini Gray, 1825 (sensu Meylan 1987) from the Late Cretaceous of Asia (Danilov and Vitek in press). Because diagnostic shell characters of both Trionychini and Trionychinae (see Meylan 1987) are not observable on the material, we conservatively identify it as Trionychidae indet.

The giant femur (the holotype of *Trionyx zakhidovi*, see Introduction) most probably belongs to "*T.*" *kansaiensis*, because of its large size. However we repeat here our previous suggestion (Vitek and Danilov 2008; Danilov and Vitek 2009, Vitek and Danilov 2010; Danilov and Vitek in press) that the name *T. zakhidovi* be considered a nomen dubium within Trionychidae.

In addition to trionychid specimens described in this paper the collection of Prinada (CCMGE 1341) includes a number of undetermined shell fragments of trionychids. Some of them were labeled as "*Aspideretes*-like", and probably correspond to Riabinin's (1938) *Aspideretes* sp.

Thus, our study confirms presence of at least two forms of trionychids at Kyrkkuduk I, as was suggested by most previous authors (Prinada 1927; Riabinin 1938; Kuznetsov and Chkhikvadze 1987; Kordikova 1994; Nessov 1997; Chkhikvadze 2007), although our study disagrees with them in taxonomic attribution of these forms.

In addition to trionychids, the turtle assemblage of Kyrkkuduk I consists of the following taxa: Adocidae: *Shachemys* sp. (Danilov et al. 2011; formerly Dermatemydidae? gen. et sp. indet.: Riabinin 1938; *Shachemys baibolatica* Kuznetsov, 1976: Nessov 1997); Lindholmemydidae: *Lindholmemys* sp. (Nessov 1997; formerly Amphichelydia? (fam. Baënidae? gen. et sp. indet.): Riabinin 1938). Riabinin (1938) also mentioned from there two forms of "Chelonia incertae sedis". Examination of original labels of the Prinada's collection (CCMGE 1341) reveals that the first form of Riabinin's "Chelonia incertae sedis" was based on xiphiplastron (CCMGE 1341) attributed by us to "*T.*" *kansaiensis* (see Referred material section on this species). The second form of Riabinin's "Chelonia incertae sedis" probably was based on a pelvic fragment (without a number) labeled as "Chelonia g. indet." This fragment represents the left half of a pelvis, consisting of articulated, proximal parts of the ilium, pubis and ischium. Because the ilium is curved posteriorly, which is a trionychid synapomorphy (Meylan 1987), this fragment certainly belongs to the Trionychidae, but the specimen cannot be identified any more precisely.

ACKNOWLEDGMENTS

We thank N.M. Kadlets, T.V. Kurazheva and A.R. Sokolov (all from CCMGE) for access to collections in their care and A.O. Averianov and J.D. Gardner for reviewing the manuscript and useful comments. Financial support for our study was provided by a grant from the President of the Russian Federation to the Leading Scientific Schools NSh–6560.2012.4 and a Robert C. Bates Travelling Fellowship to NSV. This research was supported by the Ministry of Education and Science of the Russian Federation to ID.

REFERENCES

Chkhikvadze V.M. 2007. A brief catalogue of fossil turtles of the North Eurasia. *Problems of Paleobiology, Tbilisi*, **2**: 126–137. [In Russian]

Danilov I.G. 2005. Die fossilen Schildkröten Europas. In: U. Fritz (Ed.). Handbuch der Reptilien und Amphibien Europas. Band 3/IIIB: Schildkröten (Testudines) II. Aula, Wiebelsheim: 329–441.

Danilov I.G., Sukhanov V.B. and Syromyatnikova E.V. 2011. New Asiatic materials on turtles of the family Adocidae with a review of the adocid record in Asia. *Proceedings of the Zoological Institute of the Russian Academy of Sciences*, **315**(2): 101–132.

Danilov I.G. and Vitek N.S. 2009. Cretaceous trionychids of Asia: a review of record and biogeography. Gaffney Turtle Symposium (17–18 October 2009, Drumheller, Canada). Drumheller, Canada: 52–58.

Danilov I.G. and Vitek N.S. In press. Chapter 23. Cretaceous trionychids of Asia: an expanded review of their record and biogeography. In: D.B. Brinkman, P.A. Holroyd and J.D. Gardner (Eds.). Morphology and Evolution of Turtles. Springer.

Engstrom T.N., Shaffer H.B. and McCord W.P. 2004. Multiple data sets, high homoplasy, and the phylogeny of softshell turtles (Testudines: Trionychidae). *Systematic Biology*, **53**(5): 693–710.

Gardner J.D. and Russell A.P. 1994. Carapacial variation among soft-shelled turtles (Testudines: Trionychidae), and its relevance to taxonomic and systematic studies of fossil taxa. *Neues Jarbuch für Geologie und Paläeontologie*, **193**: 209–244.

Joyce W.G. and Lyson T.R. 2010. A neglected lineage of North American turtles fills a major gap in the fossil record. *Palaeontology*, **53**(2): 241–248.

Khosatzky L.I. 1966. About a gigantic Mesozoic representative of trionychids and several features of the shell of these turtles. In: Pozvonochnye zhivotnye Sredney Azii. Fan, Tashkent: 150–157. [In Russian]

Kordikova E.G. 1991. Katalog iskopaemykh trekhkogotnykh cherepakh Sovetskogo Soyuza [Catalogue of fossil trionychid turtles of the Soviet Union]. Preprint. L.Sh. Davitashvili Institute of Paleobiology, Tbilisi, 14 p. [In Russian]

Kordikova E.G. 1994. Review of fossil trionychid localities in the Soviet Union. *Courier Forschungs-Institut Senckenberg*, **173**: 341–358.

Kuznetsov V.V. and Chkhikvadze V.M. 1987. The Late Cretaceous trionychids from Shakh-Shakh locality in Kazakhstan. *Materialy po istorii fauny i flory Kazakhstana*, **9**: 33–39. [In Russian]

Meylan P.A. 1987. The phylogenetic relationships of softshelled turtles (family Trionychidae). Bulletin of the AmericanMuseum of Natural History, 186: 1–101.

Nessov L.A. 1997. Nemorskie pozvonochnye melovogo perioda Severnoy Evrazii [Cretaceous nonmarine vertebrates of Northern Eurasia]. Saint Petersburg State University, Institute of Earth Crust, Saint Petersburg, 218 p. [In Russian]

Prinada V.D. 1927. Report on excavation of sites, where dinosaur bones were discovered. *Izvestiya Geologicheskogo komiteta*, **45**(4): 453–454. [In Russian]

Riabinin A.N. 1938. Some results of the studies of the Upper Cretaceous dinosaurian fauna from the vicinity of the station Sary-Agach, South Kazakhstan. *Problems of Paleontology*, **4**: 125–135. [In Russian and English]

Vitek N.S. 2011. Insights into the taxonomy and systematics of North American Eocene softshelled turtles from a well-preserved specimen. *Bulletin of the Peabody Museum of Natural History*, **52**(2): 189–208.

Vitek N.S. In press. Giant fossil soft-shelled turtles of North America. *Palaeontologia Electronica*.

Vitek N. and Danilov I.G. 2008. Morphology and systematic position of trionychid turtles from the Late Cretaceous of Kazakhstan and Tadzhikistan. Modern Paleontology: Classic and New Methods. The Fifth All-Russian Scientific School for Young Scientists in Paleontology (6–8 October, 2008, Moscow, Russia). Abstracts: 17–18. [In Russian]

Vitek N.S. and Danilov I.G. 2010. New material and a reassessment of soft-shelled turtles (Trionychidae) from the Late Cretaceous of Middle Asia and Kazakhstan. *Journal of Vertebrate Paleontology*, **30**: 383–393.

Submitted February 3, 2012; accepted February 27, 2012.